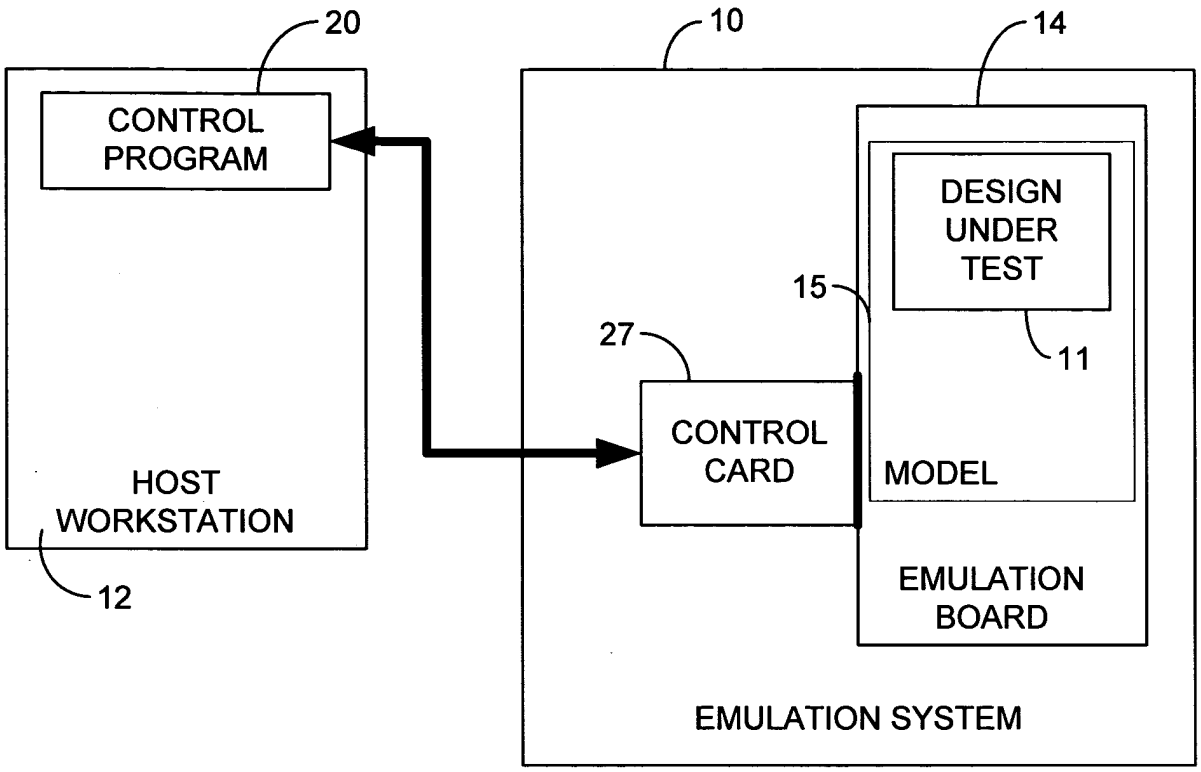


FIG. 1A (Prior Art)

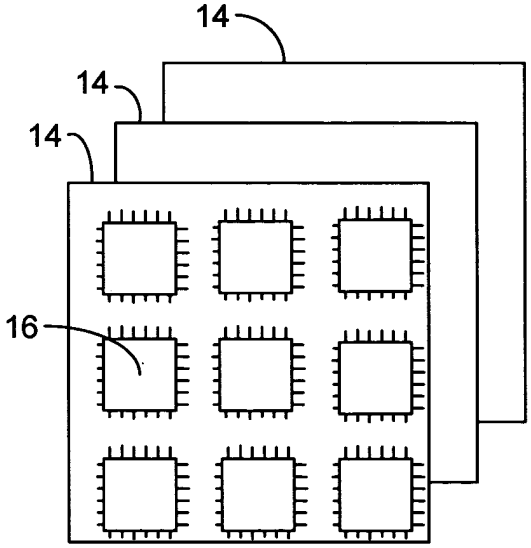


FIG. 1B (Prior Art)

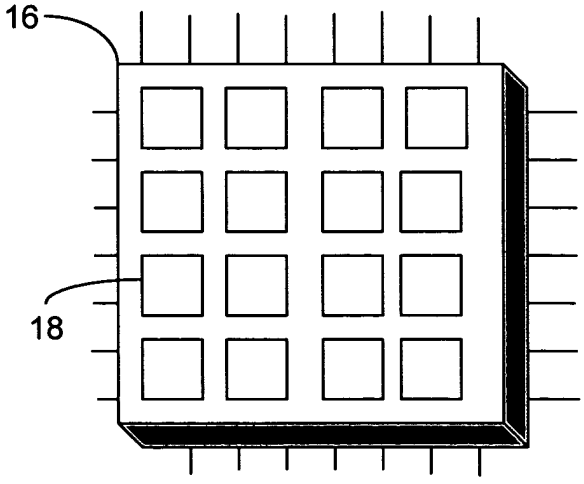


FIG. 1C (Prior Art)

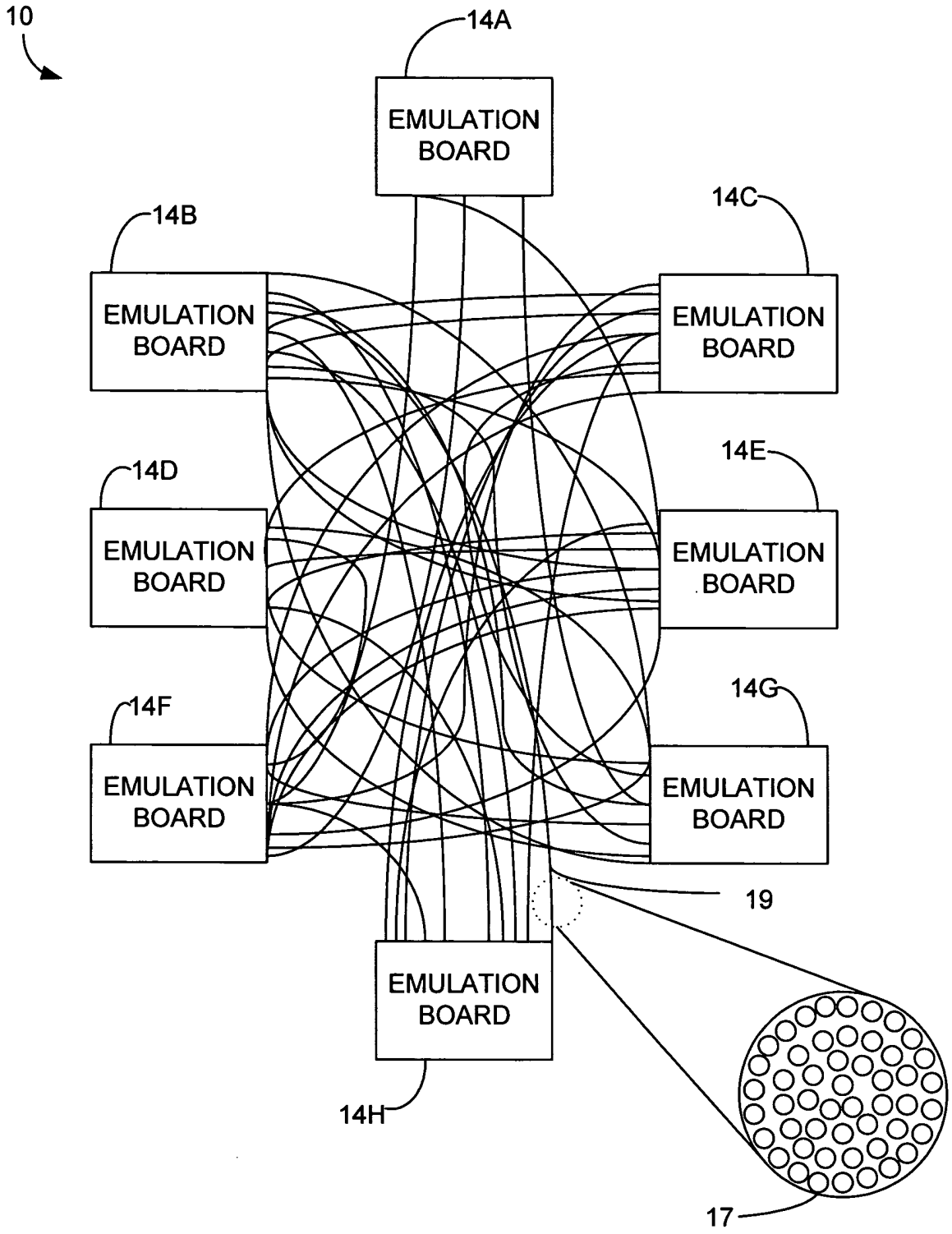


FIG. 2 (Prior Art)

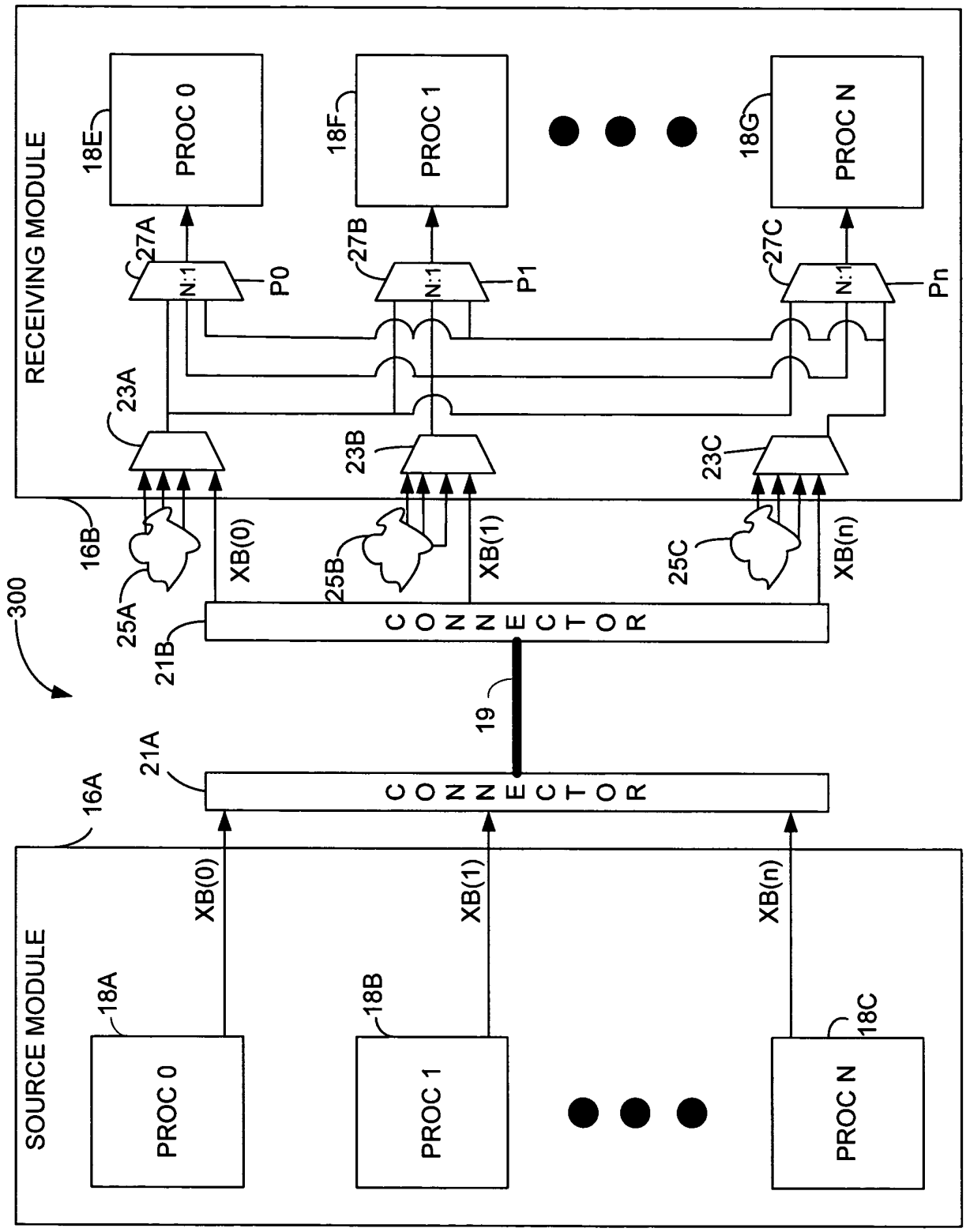


Figure 3 (Prior Art)

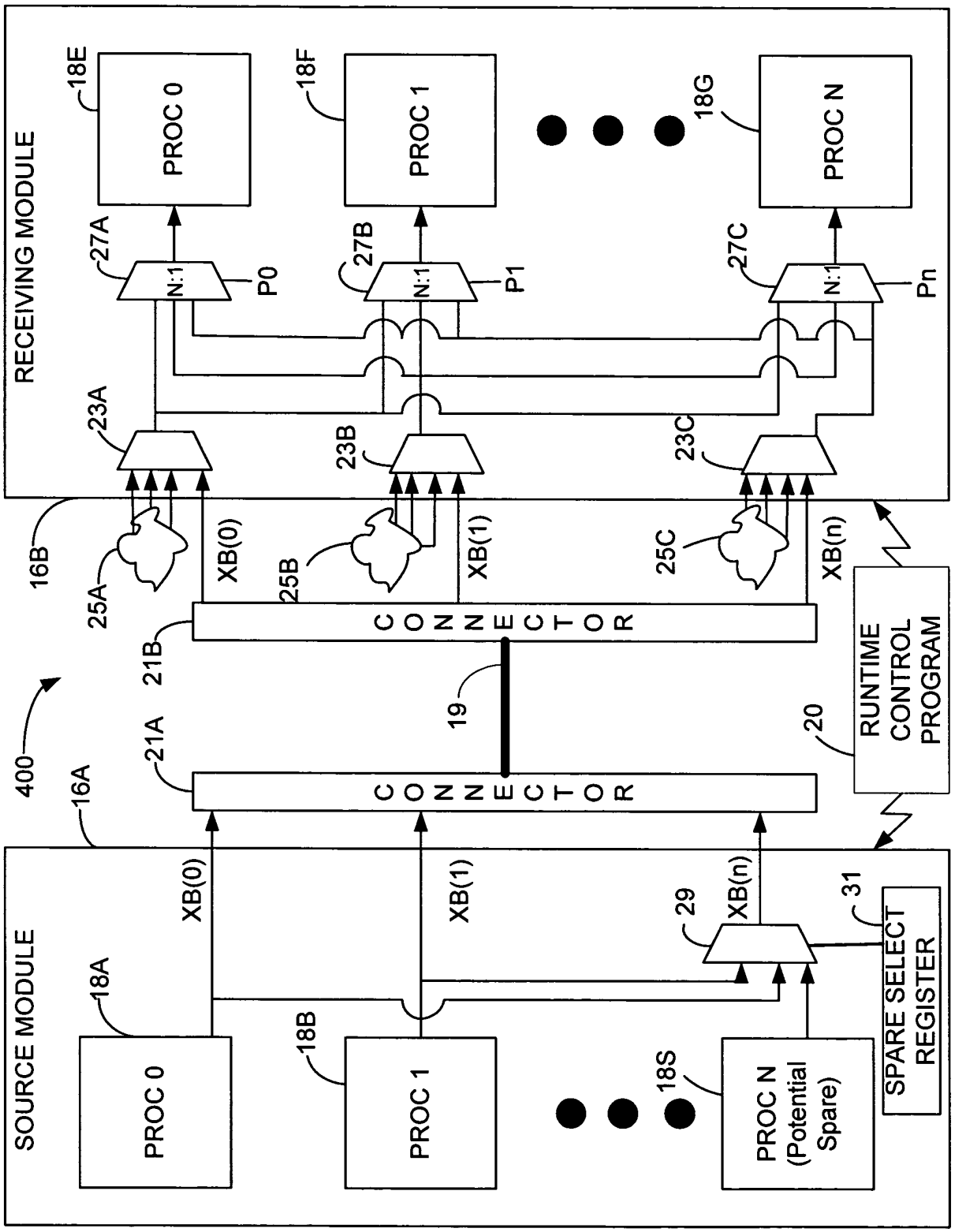

RECEIVING MODULE
PROC 0
PROC 1
PROC N
18E
18F
18G
27A
27B
27C
N:1
P0
P1
Pn
23A
23B
23C
16B
25A
25B
25C
XB(0)
XB(1)
XB(n)
CONNECTOR
21B
21A
19
400
16A
20
RUNTIME CONTROL PROGRAM
SOURCE MODULE
18A
18B
18S
PROC 0
PROC 1
PROC N (Potential Spare)
29
31
SPARE SELECT REGISTER

Figure 4

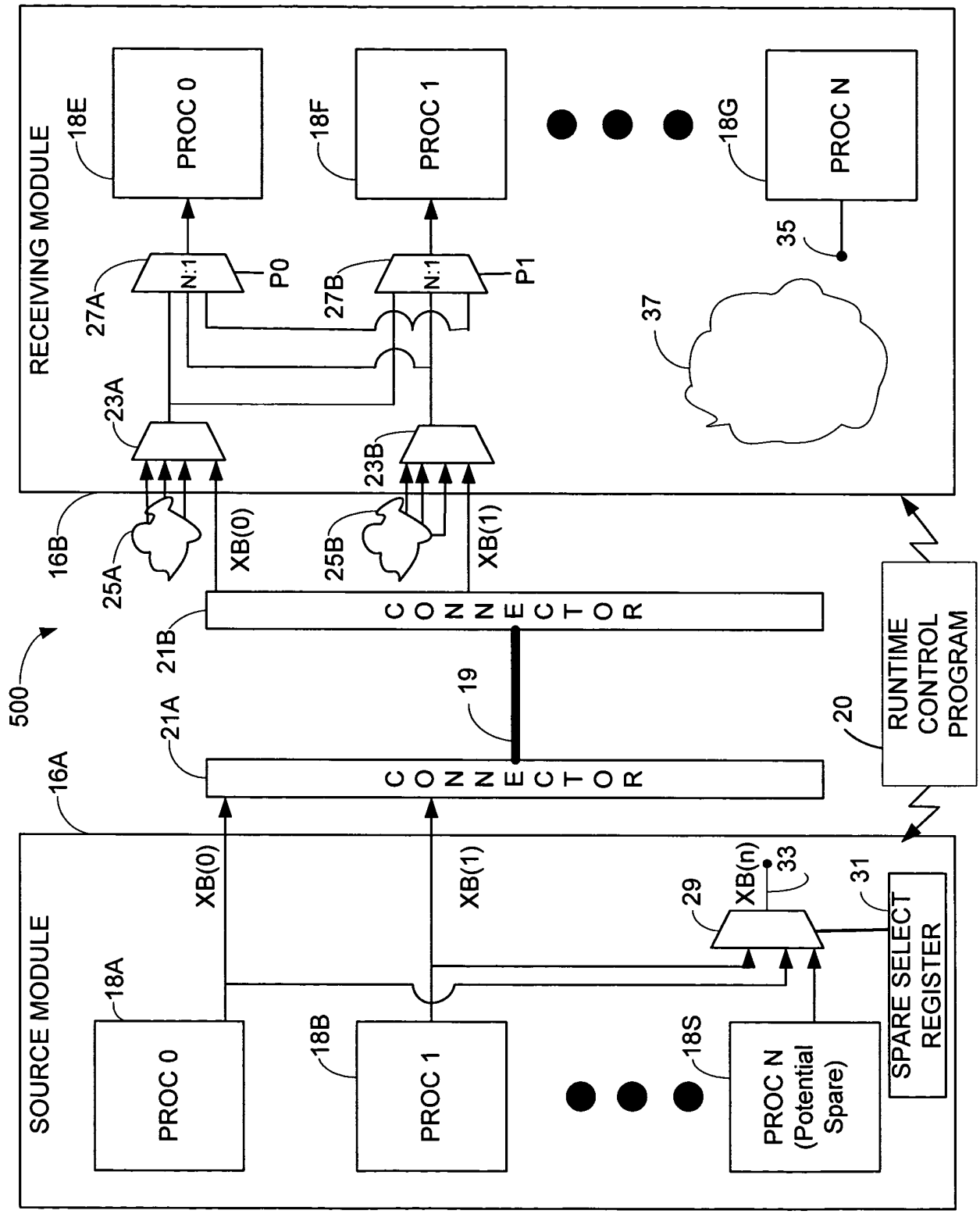

RECEIVING MODULE
PROC 0
PROC 1
PROC N
18E
18F
18G
35
37
27A
27B
N:1
P0
P1
23A
23B
16B
25A
25B
XB(0)
XB(1)
CONNECTOR
21B
21A
19
500
16A
20
RUNTIME CONTROL PROGRAM
SOURCE MODULE
18A
18B
18S
PROC 0
PROC 1
PROC N (Potential Spare)
XB(n)
29
33
31
SPARE SELECT REGISTER

Figure 5

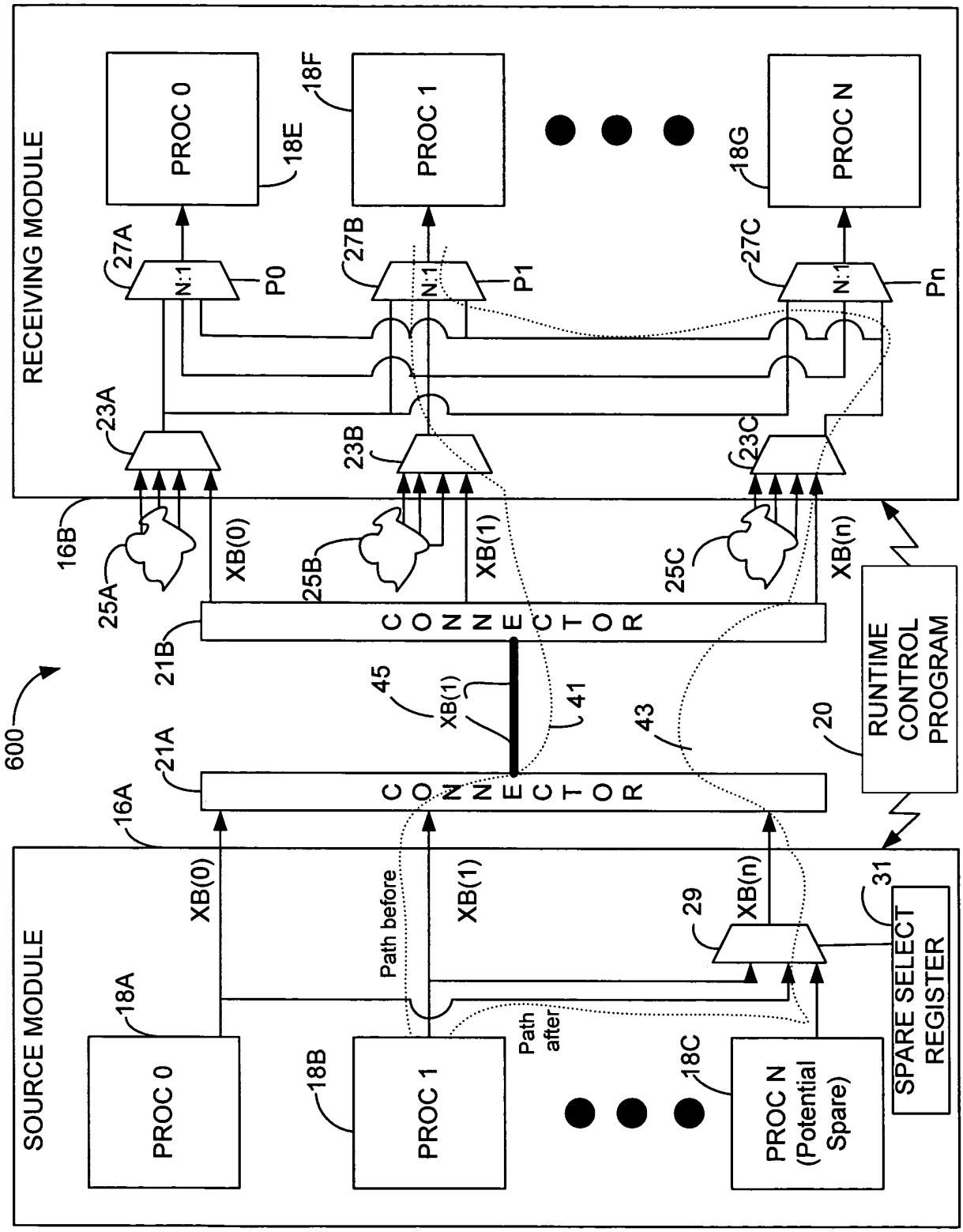
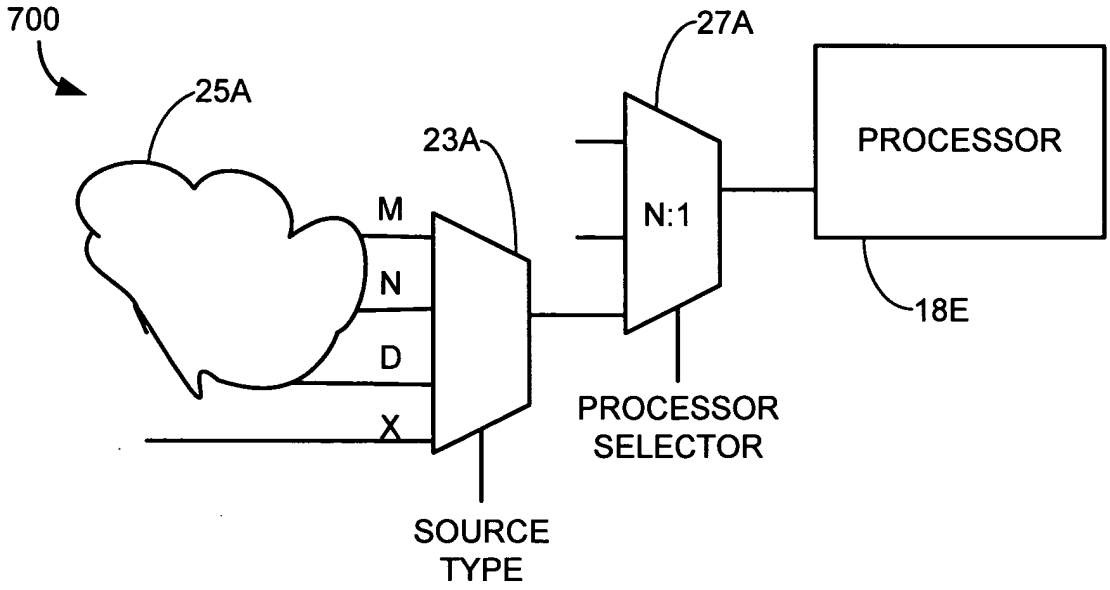

600
SOURCE MODULE
RECEIVING MODULE
PROC 0
PROC 1
PROC N (Potential Spare)
PROC 0
PROC 1
PROC N
18A
18B
18C
18E
18F
18G
16A
16B
21A
21B
CONNECTOR
CONNECTOR
XB(0)
XB(1)
XB(n)
XB(0)
XB(1)
XB(n)
Path before
Path after
23A
23B
23C
25A
25B
25C
27A
27B
27C
N:1
N:1
N:1
P0
P1
Pn
29
31
SPARE SELECT REGISTER
45
41
43
20
RUNTIME CONTROL PROGRAM

Figure 6



710

Step	Source Type Sel	Proc Select	Change Proc Sel	New Proc Sel Value	Source Type Sel	Proc Select	Change Proc Sel	New Proc Sel Value
0	M	0	no	n/a	M	13	no	n/a
1	M	1	no	n/a	X	1	yes	31
2	M	1	no	n/a	X	1	yes	31
3	M	0	no	n/a	M	0	no	n/a
4	X	23	no	n/a	X	3	no	n/a
5	N	1	no	n/a	N	1	no	n/a
6	N	20	no	n/a	N	2	no	n/a
7	X	1	yes	31	X	5	no	n/a
8	X	16	no	n/a	X	6	no	n/a
9	M	30	no	n/a	N	3	no	n/a
10	X	2	no	n/a	X	2	no	n/a
11	X	1	yes	31	N	1	no	n/a
12	X	0	no	n/a	N	0	no	n/a
13	X	0	no	n/a	X	1	yes	31
14	N	5	no	n/a	N	6	no	n/a
15	X	6	no	n/a	X	7	no	n/a
16	M	7	no	n/a	M	0	no	n/a

FIG. 7

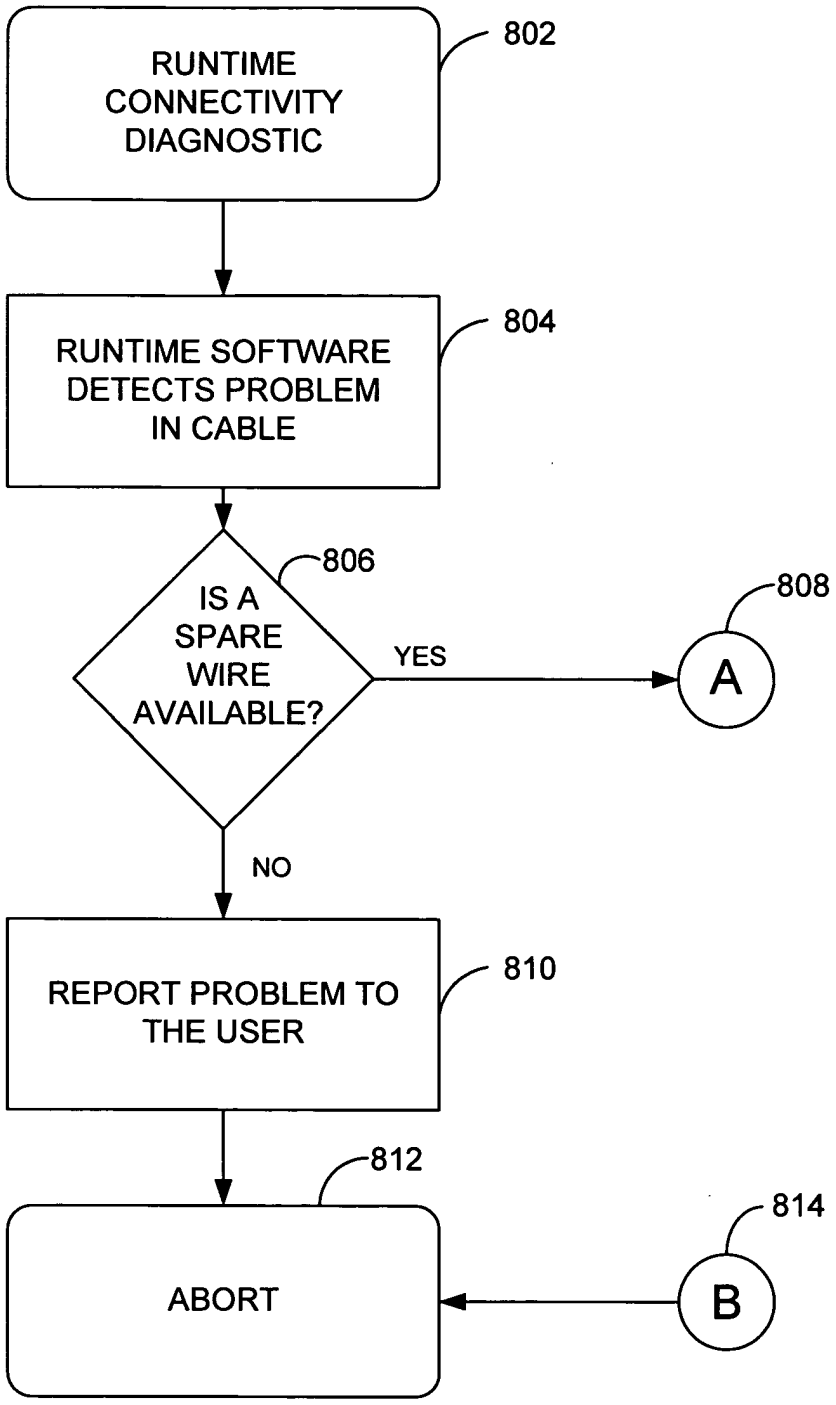

RUNTIME CONNECTIVITY DIAGNOSTIC
802
800
RUNTIME SOFTWARE DETECTS PROBLEM IN CABLE
804
IS A SPARE WIRE AVAILABLE?
806
YES
808
A
NO
REPORT PROBLEM TO THE USER
810
812
ABORT
814
B

FIG. 8A

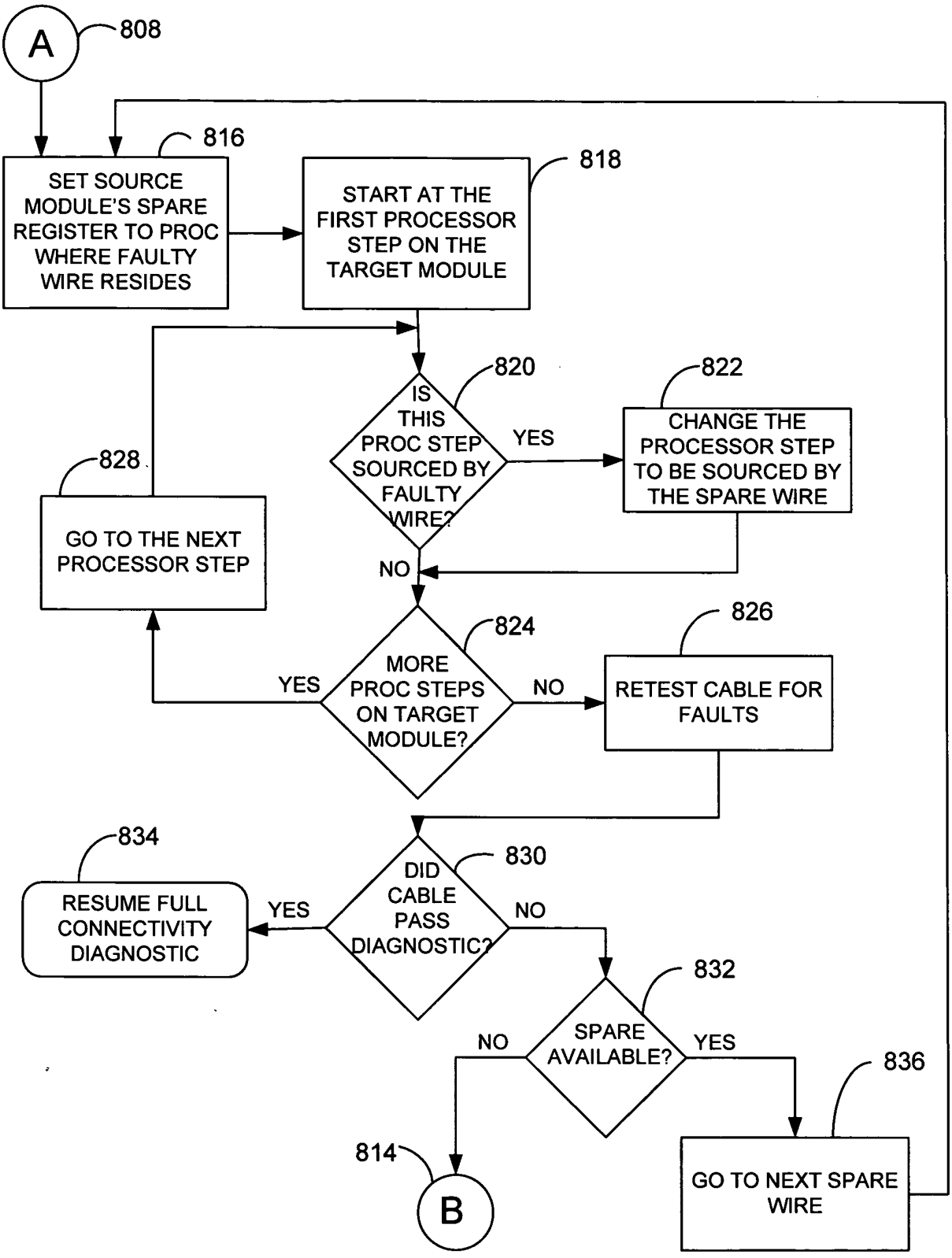

A
808
816
SET SOURCE MODULE'S SPARE REGISTER TO PROC WHERE FAULTY WIRE RESIDES
818
START AT THE FIRST PROCESSOR STEP ON THE TARGET MODULE
820
IS THIS PROC STEP SOURCED BY FAULTY WIRE?
YES
822
CHANGE THE PROCESSOR STEP TO BE SOURCED BY THE SPARE WIRE
NO
828
GO TO THE NEXT PROCESSOR STEP
824
MORE PROC STEPS ON TARGET MODULE?
YES
NO
826
RETEST CABLE FOR FAULTS
834
RESUME FULL CONNECTIVITY DIAGNOSTIC
YES
830
DID CABLE PASS DIAGNOSTIC?
NO
832
SPARE AVAILABLE?
NO
YES
836
GO TO NEXT SPARE WIRE
814
B

FIG. 8B